BLM LIBRARY
88081497

POWDER RIVER

TRACT PROFILE
NORTH DECKER TRACT, MONTANA

REVISED

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

DEPT. OF INTERIOR
BUREAU OF LAND MANAGEMENT
1981 DEC 11 AM 8:00
RECEIVED
MONTANA STATE OFFICE
BILLINGS, MONTANA

*54791001

ID:88081497

HD
242.3
.P6963a

SITE SPECIFIC ANALYSIS
9. NORTH DECKER

INTRODUCTION

A. PURPOSE AND NEED

The purpose of this analysis is to comply with the Secretary of Interior's decision that a sufficient number of tracts be delineated and selected for sale from the areas designated in land use plans as acceptable for further consideration for leasing to meet the regional leasing target. As a result of the 1979 Powder River Management Framework Plan (MFP) Update, federal coal in this tract was identified for further consideration for development through competitive leasing.

It should be noted that the acreage and legal description of federal coal discussed in this Site Specific Analysis is limited to those areas that have been included in the comprehensive land-use plan, in accordance with Section 3(A)(i) of the Federal Coal Leasing Amendments Act of 1976, and the decision of the U.S. Secretary of Interior June 2, 1979, that the coal to be selected for sale come "from the areas designated in land-use plans as acceptable for further consideration," (page 60 of Volume I of the Secretarial Issue Document). The coal deposit tonnage listed from the Engineering Report of the U.S. Geological Survey includes areas outside of the BLM planning area.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

I. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. NO ACTION ALTERNATIVE

Under the no action alternative, approximately 3000 acres of federal coal containing approximately 62 million tons would not be leased. If not mined in connection with the existing 2361 acres of federal coal leased within the Economical Mining Unit (EMU), the area proposed for lease will not be mined. This determination was made based on increased stripping ratios and the shape of the proposed lease. It should be noted that mining will begin in 1981 within the EMU on the existing federal lease regardless of additional leasing.

B. PROPOSED ACTION

For the purpose of this action we are assuming new mining will begin as an extension of the existing West Decker Unit. The assessment will address the existing environment and impacts for the entire EMU (5361 acres).

The proposed action is to offer for lease a 3,001-acre tract of land in southeastern Big Horn County, containing 59 million tons of recoverable coal for development as a mine extension. The EMU comprises a 5,402-acre area containing 126 million tons of coal identified as economical mining unit for development of a 40-year strip mining operation. The tract contains 2361 acres of leased federal coal (67.4 million tons). The tract is located 4 to 5 miles northeast of Decker and one mile east of State Highway 314. See Map 1 for location and legal description.

The mining operation would have an annual production of 3.0 million tons and would employ 50 persons during construction and 84 persons during production. The tract is composed of 126 million tons of federal coal (Dietz 1 and Dietz 2 seams.) Surface disturbance will be approximately 133 acres a year beginning in 1981. Total disturbed area will be 5,402 acres from mining. Facilities and haul roads are in place.

For more specific information on the proposed mining operation, refer to the Engineering Report prepared by the U.S. Geological Survey.

The proposed action assumes that proper mining and reclamation will be carried out according to existing state and federal regulations. These include: Office of Surface Mining Reclamation and Enforcement (OSM) regulations (30 CFR 700-899), Environmental Protection Agency (EPA) regulations (40 CFR 0-1399), Department of the Interior's coal management program regulations (43 CFR 23 and 3400 and 30 CFR 211), and regulations of the Montana Department of State Lands.

Tract Delineation Report Summary

Tract Name: North Decker State: Montana

The North Decker tract is located in the center of the northern Powder River Basin, Big Horn County, Montana. The tract contains one recoverable coal bed, the Dietz, which is present in multiple seams.

The coal deposit occurs in the top part of the Fort Union Formation (Paleocene), which comprises approximately 3,000 feet of sandstones, shales, siltstones, and coal seams. The formation occurs in nearly flat-lying beds. The coal is subbituminous in rank and weighs 1,770 tons per acre-foot. There are no known geologic hazards to surface mining in the North Decker tract. See the tract profile summary for the salient geologic data for the tract.

The generic mining plan calls for a surface mine using draglines, electric shovels, dump trucks, loaders, scrapers, and other support equipment. The coal would thus be mined to a depth of 200 feet or until the limiting stripping ratio (6:1) has been reached. The plan indicates that the coal would be shipped by railroad to an electrical utility out of the Powder River Region.

Tract Profile Summary

North Decker

Coal Data	Proposed Action
Total Reserves (Million Tons Strippable)	66
Recoverable Reserves (Million Tons)	federal 59 (total 126)
Average Coal Thickness (Ft.)	50
Average Overburden (Ft.)	175
Coal Rank	subbituminous
Percent Recovery	90
Proximate Coal Analysis	
Percent Moisture	23.6
Percent Ash	4.1
Percent Sulfur	0.4
BTUs Per Pound	9,738
Mine Life (Years)	40
Annual Production Rate (Million Tons)	3.3
Tract Area (Acres)	3,001
Surface Mine/Truck Shovel Operation	
Employment	
Construction	50
Mine Operation	84
Environmental Data	
Water Requirements	66 acre-feet/year.
Transportation, Land Use, VRM, Vegetation	Moderate during mining; low after mining.
Soils	High to moderate.
Reclamation	Low, if successful.
Wildlife	Moderate loss of habitat.
Noise, Air Quality	High during mining, low after successful reclamation.
Agriculture	Moderate during mining; low after successful reclamation.

TRACT PROFILE INTRODUCTION

Background

In July 1979, the BLM, Miles City District Office completed the Powder River Resource Area update for portions of Powder River, Custer, Big Horn, Treasure and Rosebud counties. The land use planning process included applying unsuitability criteria, multiple-use conflict evaluation, and surface owner consultations. As a result of that work, areas were identified that could be further considered for coal development. The areas are available for consideration for new competitive leasing, leasing by exchanging and modifying existing leases.

Following land-use planning the BLM requested expression of interest which, along with other information, guided the GS in delineating this tract. Results of that work are summarized in this profile.

Personnel from BLM, Miles City District inventoried the tract to determine the site specific resource values and then analyzed potential environmental effects of coal development on this individual tract. Among other items, the unsuitability criteria (43 CFR 3461) were reconsidered on this site-specific basis. Any new findings of unsuitability are reflected in the delineation and development proposal of the tract described in this profile.

To be further considered for new competitive leasing, the tract will be presented to the Regional Coal Team who guides and reviews tract ranking and selection and sale scheduling procedures that develop alternatives which would be analyzed in a regional environmental impact statement (EIS). The EIS would analyze the site-specific and regional cumulative effects of coal leasing and development. Alternatives addressed in the EIS would include different combinations of tracts that meet a regional coal leasing target. The analysis of those groups of tracts would result in different impacts than the assessment made in this document for this specific tract. During the process this preliminary tract could be modified. Ultimately, the Secretary will select specific tracts for lease sale. If the tract is leased, the lessee would be required to submit a plan for mining and reclamation (M&R) to the Secretary of Interior, Office of Surface Mining (OSM) for review and approval within 3 years after leasing. Once a mining plan has been submitted, OSM would review the proposed developments of the mining plan. OSM would prepare a site-specific environmental asse sment or EIS prior to approval of the mine plan.

Development of the tract is in accordance with the federal coal management program adopted by the Secretary, Department of the Interior, in June 1979. Basis of the program was, in part, the Final Environmental Statement for the Federal Coal Management Program. Implementation procedures are contained in Title 43 - Code of Federal Regulations - Part 3400 (43 CFR 3400). Authorizing actions are The Mineral Leasing Act of 1920, as amended; The Mineral Leasing Act for Acquired Lands of 1947, as amended; the Federal Land Policy and Management Act of 1976; the Surface Mining Control and Reclamation Act of 1977; the Multiple Mineral Development Act of 1954; the Department of Energy Organization Act of 1977; the National Environmental Policy Act of 1969; the Federal Coal Leasing Amendments Act of 1976, as amended; the Act of October 30, 1978, and Federal Regulations concerning federal coal leasing and development including 43 CFR 3400; 30 CFR 211; and 30 CFR 700-899.

In adopting the coal program, the Secretary established a tentative competitive coal leasing target of 776 million tons for 1982 in the Powder River Region of Wyoming and Montana. Subsequent sales would then follow on a 2 to 4 year cycle.

Purpose and Need for Action

Purpose of the action is to offer strippable federal coal reserves that can be further considered for coal leasing and development to help meet the energy needs of the nation.

This tract profile contains a summary of the tract delineation report and a site-specific analysis (SSA). The United States Department of the Interior, Geological Survey (GS) delineated the tract while the Bureau of Land Management (BLM) completed the site-specific environmental inventory and preliminary analysis.

Figure 1.2-1

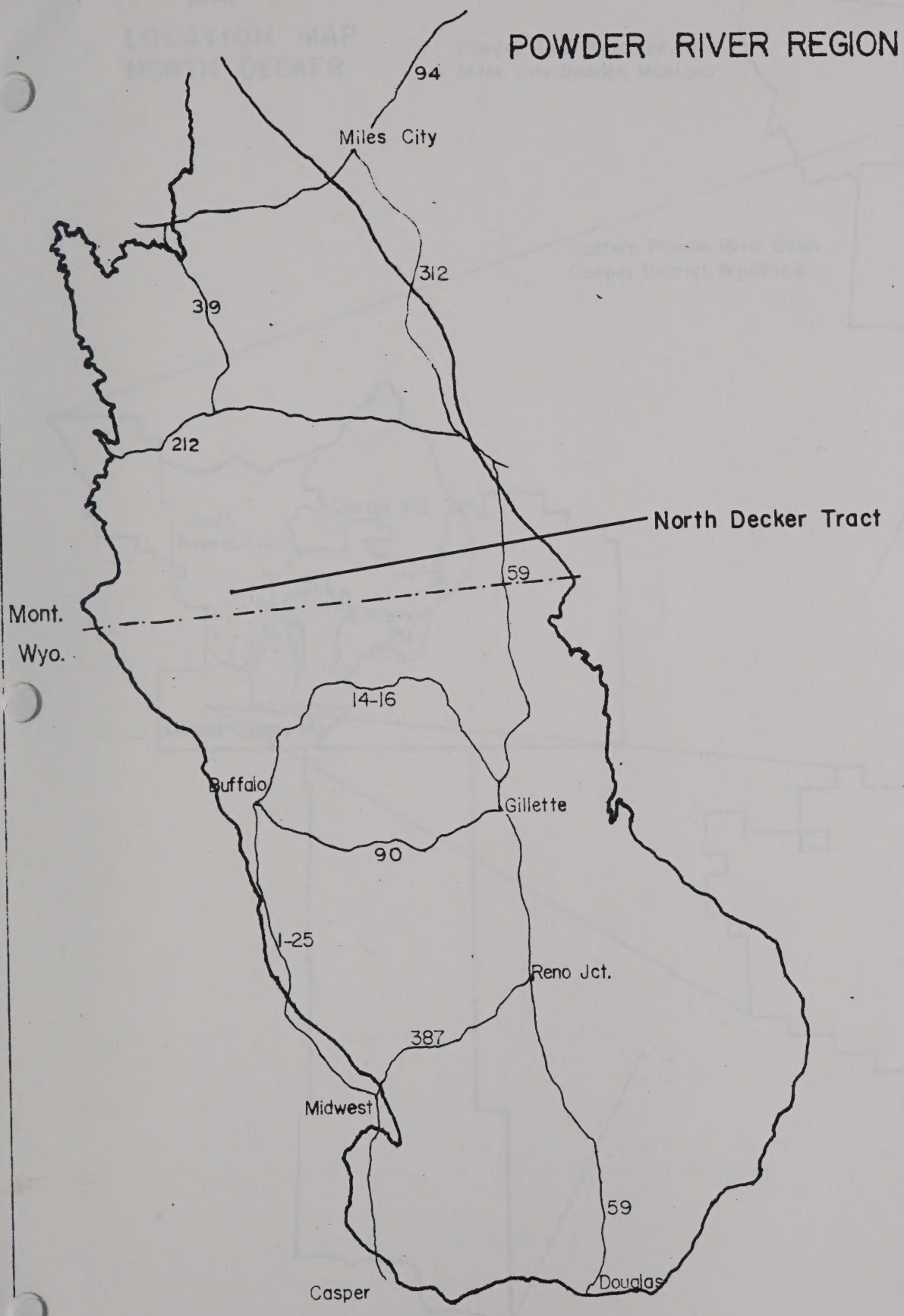
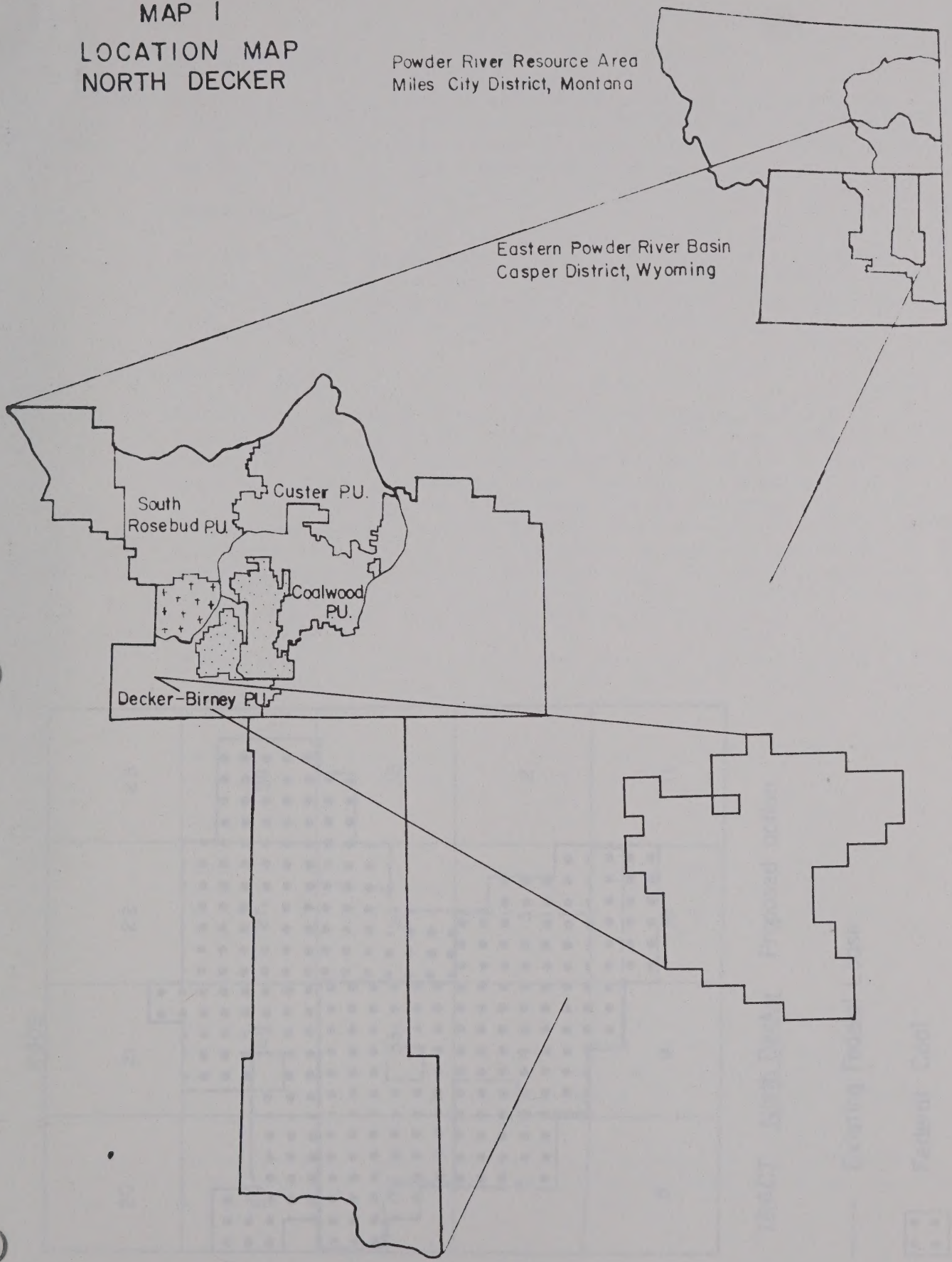
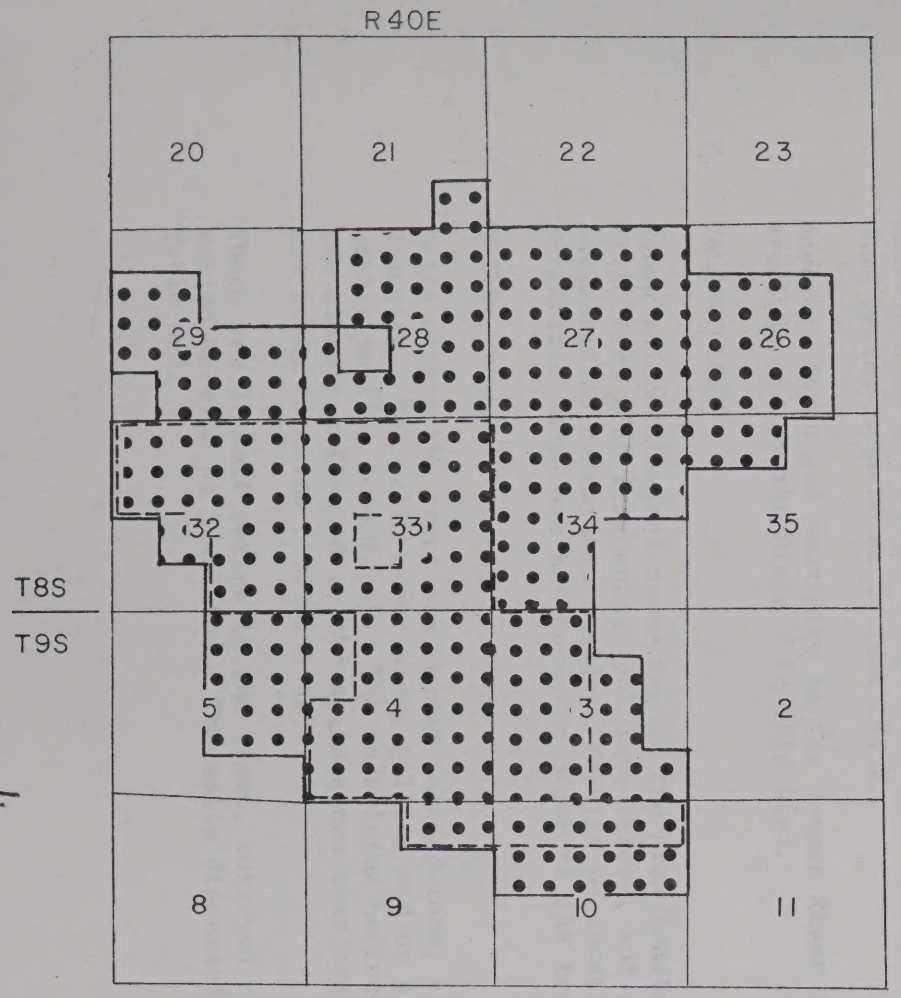


FIGURE 1.2-1

MAP 1
LOCATION MAP
NORTH DECKER

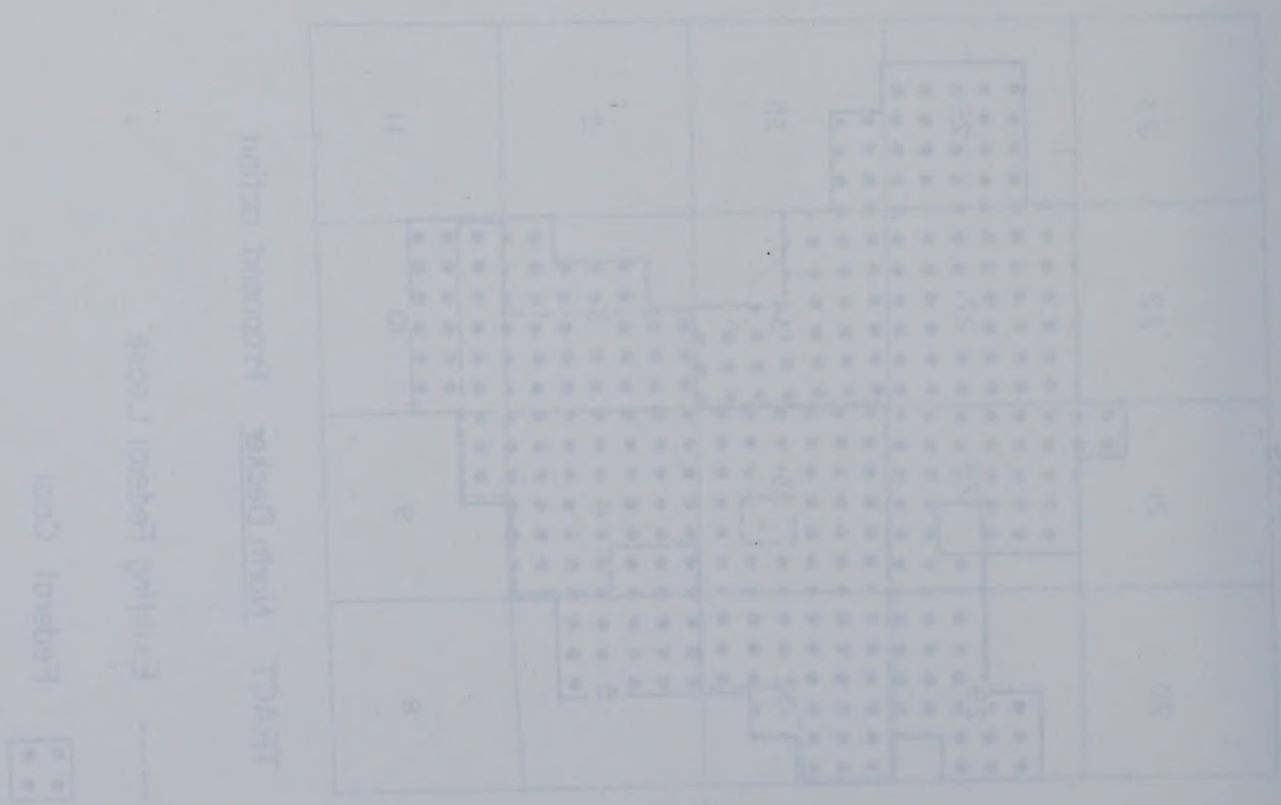




TRACT North Decker Proposed action

----- Existing Federal Lease

Federal Coal



II. AFFECTED ENVIRONMENT

The environment that currently exists and changes anticipated from ongoing trends are included in this section. Information is presented within the time frame of the proposed action including the alternatives, and is restricted to that information required to assess significant impacts.

A. TOPOGRAPHY

The EMU adjoins the westcentral edge of the Tongue River Reservoir. Surface expression consists of flat to gently rolling terrain that slopes downward toward the reservoir. Elevations range from 3424 feet (spillway level) to 3745 feet above sea level.

B. GEOLOGY

The area is underlain by sandstone, shale, clinker, and coal belonging to the Tongue River Member of the Fort Union Formation (Paleocene). Recoverable coal reserves in the EMU have tentatively been estimated at 126 million tons. Reserves are based on coal within the Anderson/Dietz 1 and Dietz 2 seams and include 67 million tons that are already leased. The remaining 59 million tons are uncommitted federal coal. Estimates of unleased coal could change substantially if additional drilling indicates the presence of unburned coal in the north part of the EMU. Interburden between the two beds varies from five to 30 feet in thickness.

The Dietz 3 or Canyon Coal seam also underlies the area and is separated from the Dietz 2 by about 115 feet of interburden. This seam varies from 18 to 20 feet thick.

However, depth and proximity to the Tongue River Reservoir may preclude mining the Dietz 3 in this area.

C. PALEONTOLOGY

Known paleontological resources in the area consist of poorly silicified tree fragments, leaf impressions, and pieces of unidentified calcareous shells. Fossils possessing exceptional scientific value are not known to occur in the tract.

D. SOILS

Soils within the tract are formed in sandstone, shale and alluvial deposits. The soils occur along gullies and on a relatively flat to gently rolling topography. The underlying bedrock characteristics are closely reflected in the soils since they are not well-developed and loamy textures predominate.

There are 27 soil series in the tract, surveyed by the Soil Conservation Service at level two. The soils discussed are listed in Table 9-1.

NORTH DECKER SOIL EROSION
TABLE 9-1

Soil Mapping Unit Name	Depth 1/ Shallow 0-20"	Moderately Deep 20-36"	Deep 36+"	Percent Slope	Soil Erosion Potential 1/ Wind	Water	Surface Acres	Percent of Area	Soil Reconst. Potential 2/	Soil Hazard Conditions	Suitability of Soil Material for Plant Growth (Acre Feet) 3/ Good	Fair	Poor
Chugter loam; Chugter complex; McRae loam			X	1-15	Low	Mod.	1305	24	Fair	Excess lime	46	6479	—
Clapper-Harvey complex, rolling			X	8-15	Low	Mod.	18	<1	Fair	Excess lime	4	51	30
Haverson loam; McRae loam			X	0-2	Low	Low	91	2	Fair	Excess lime	21	434	—
Haverson and Lohmiller silts, channeled			X	—	Low	High	165	3	Poor	Excess lime, too clayey	—	—	825
Heldt silty clay loam; Thurlow silty clay loam			X	0-8	Low	Low	137	3	Fair	Excess lime, too clayey	—	685	—
Hydro loam			X	0-8	Low	Mod.	61	1	Poor	Excess lime	26	—	279
Hydro silty clay loam			X	2-4	Low	Low	84	2	Poor	Excess lime	—	35	385
Hydro-Allentine complex; Lohmiller silty clay loam			X	0-4	Low	Low	64	1	Poor	Excess lime, too clayey	31	—	290
Midway-Thedalund complex, hilly	X (.75)	X (.25)		—	Low	High	92	2	Poor	Excess lime	—	16	89
Shale Outcrop-Midway complex, steep	X			25-90	Mod.*	High	3	<1	Fair	Excess lime, erosion	—	3	1
Spearman loam, undulating		X		4-8	Low	Mod.	106	2	Fair	Too clayey, stoniness	—	204	—
Spearman-Wibaux complex, rolling	X (.40)	X (.60)		—	Low	High	485	9	Fair	Too clayey, stoniness	34	383	306
Thedalund-Wibaux loams, undulating	X (.45)	X (.50)	X (.05)	4-8	Low	Mod.	1	<1	Poor	Excess lime, stoniness	<1	1	1

1/ Soil Depth Classification and Soil Erosion Potential is derived from the Big Horn County Soil Survey Report.

2/ Soil Reconstruction Potential is derived from the National Soils Handbook.

3/ Depth (in acre feet) of available soil calculated from acres x acre feet/acre = suitability of soil material for plant growth.

* variable wind erosion potential

Soil Mapping Unit Name	Depth 1/ Shallow 0-20"	Moderately Deep 20-36"	Deep 36+"	Percent Slope	Soil Erosion Potential 1/ Wind	Water	Surface Acres	Percent of Area	Soil Reconst. Potential 2/	Soil Hazard Conditions	Suitability of Soil Material for Plant Growth 3/ Good	Fair	Poor
Thedalund-Wibaux 37+ loams, hilly	X(.45)	X(.55)		—	Low	High	342	6	Fair	Excess lime, stoniness	—	424	79
Thedalund-Wibaux complex, very steep	X(.55)	X(.45)		35-90	Low	High	29	1	Poor	Stoniness, slope	—	17	30
Thurlow-Midway silty clay loams	X(.40)		X(.60)	4-15	Low	Mod.	9	41	Fair	Excess lime, too clayey	—	26	4
Traversilla-Thedalund loams, rolling	X			8-15	Low	Mod.	64	1	Fair	Excess lime, stoniness	17	70	11
Wibaux loam, hilly	X			15-35	Low	High	645	12	Fair	Stoniness	—	484	—
Wibaux-Spearman complex, rolling	X(.55)	X(.40)	X(.05)	—	Low	Mod.	16060	31	Fair	Too clayey, stoniness	116	2125	—
TOTALS							53601	100			295	11437	2330

Soil Depth
Shallow - 38%
Moderately Deep - 24%
Deep - 38%

Soil Erosion Potential
Wind: Low - 100%
Water: Low - 8%, Moderate - 59%, High - 33%

Soil Reconstruction Potential
Fair - 90%
Poor - 10%

Suitability of Soil Material for Plant Growth
Good - 1%
Fair - 43%
Poor - 9%
Unsuitable - 47%

E. WATER RESOURCES

1. Ground Water

Much of the North Decker tract contains permeable clinker, which makes for the highest ground water flow rates of any of the tracts. The premining flow rates are estimated to be over 200,000 cubic feet per day (cu ft/day) (Van Voast and Hedges, 1975). Two stock wells and one domestic well are in use in the non-leased portion of the tract. Medium total dissolved solids (TDS) concentration of wells in the tract is about 1,200 milligram per liter (mg/l) and ranges from 800 to 3,980 mg/L.

2. Surface Water

Spring Creek runs through about 80 acres of non-leased federal coal surface acreage of the tract. It flows only in response to intense rain and snow melt. Mean, annual flow is estimated at 213 acre feet (Woodward-Clyde 1980). Irrigation has been minimal from Spring Creek. However, Tongue River Reservoir water is used for irrigating some of the tract acreage. About four miles of the tract borders the Reservoir. Average TDS concentration is about 675 mg/L.

3. Alluvial Valley Floors and Floodplains

Spring Creek is a possible alluvial valley floor (AVF). Final AVF determination is pending.

F. VEGETATION

The North Decker Economical Mining Unit (EMU) is made up of one major vegetative rangeland type (Payne 1973), which is the central grassland (See Regional paper, unpublished manuscript in Miles City District Office of BLM). The area included in the vegetative type consists of: (a) grassland - 1,694 acres, (b) sagebrush-grassland - 3,044 acres, (c) Other 623 acres.

Within this vegetative type, there are varying range sites with varying production yields (pounds per acre) and condition classifications. There are approximately 1,031 AUMs being produced per year on the tract.

G. LAND RESOURCES

1. Agriculture

Agriculture operations in this area are mainly livestock, hay (alfalfa or grass-legume) and some small grains. The bottomlands were flood-irrigated prior to their acquisition by Decker Coal Co. Alfalfa, grass-legume hay or small grains (oats or barley) are crops raised to feed the livestock in the winter months. Wheat is raised to sell. Approximately 12 percent of the tract, which is class II and III land, is currently being used as cropland. In addition, there are approximately 1,442

acres of class III and IV privately-owned land (26.9 percent of the tract) that are suitable for cropping, but not presently cropped.

Approximately 1,442 acres could produce approximately 3,328 tons of alfalfa and support 721 AUMs or produce 39,024 bushels of wheat per year. Federal land consists of approximately 274 acres (5.1 percent) of Class II, III and IV land that is suitable for cropland that could provide approximately 767 tons of alfalfa hay and 210 AUM's or 8,990 bushels of wheat that is not being cropped.

The State of Montana owns about three acres of Class III and IV land (0.06 percent of the tract) that is suitable for cropland, but is not presently being cropped. This land could produce 4.5 tons of alfalfa and support two AUMs or produce 63 bushels of wheat.

2. Recreation

The EMU is relatively isolated from recreational use or demand and there is no recreational development in or near the area.

Some very limited hunting use may occur, but any other recreation activity is unlikely. Since no public access exists, use of the tract for recreation would require landowner permission. This restriction, along with remoteness from population centers, effectively prohibits recreational use. The area contains no wilderness potential.

3. Other Land Uses

The land within the tract is presently used for ranching with some farming of hay and wheat fields in the bottomlands of the river. There are no industrial activities and the only other use of the tract is for a portion occupied by State Highway 314 and a county road. Existing roads are gravel and receive moderate use and maintenance.

H. WILDLIFE AND FISHERIES

The Decker North EMU is a mixture of grassland and sagebrush-grassland. Big sagebrush (Artemisia tridentata) is the dominant shrub.

Antelope are present yearlong in the Decker area. Portions of three crucial antelope wintering areas have been identified in the EMU. These wintering areas lie within the Spring Creek drainage, which has supported up to 375 antelope during the hard winter of 1977-1978. Average yearly populations are two antelope/sq mi.

Twenty to 30 mule deer utilize the EMU, primarily from spring green-up until the fall snowfall. The alfalfa bottoms are important use areas during the spring as they provide early season high protein feeding areas. Winter mule deer use is minimal.

No raptor nesting has been identified in the EMU but one golden eagle nest has been identified one mile to the north. Since it was outside the original lease recommendation area boundary, only ten acres were excluded by the unsuitability criteria to prevent disturbance of the nest.

The bald eagle has been identified as a migrant in the Decker area, where they frequent the Tongue River and Tongue River Reservoir. No other endangered or threatened species are known to occur in the area.

The Tongue River Reservoir adjacent to the EMU is important to some waterfowl. Canada geese utilize the shallow bays around the reservoir. As summer drawdown advances and the mudflats of these bays dry up, the geese move onto the alfalfa bottoms to feed.

State of Montana species of special interest or concern found on or near the EMU are the: osprey, Swainson's hawk, ferruginous hawk, merlin, prairie falcon, upland sandpiper, long-billed curlew, long-eared owl, eastern bluebird, clay-colored sparrow, Brewer's sparrow, long-legged bat, big-eared bat and plains hognose snake. Actual use of the area by these species is low to non-existent, depending on the individual species habitat requirements.

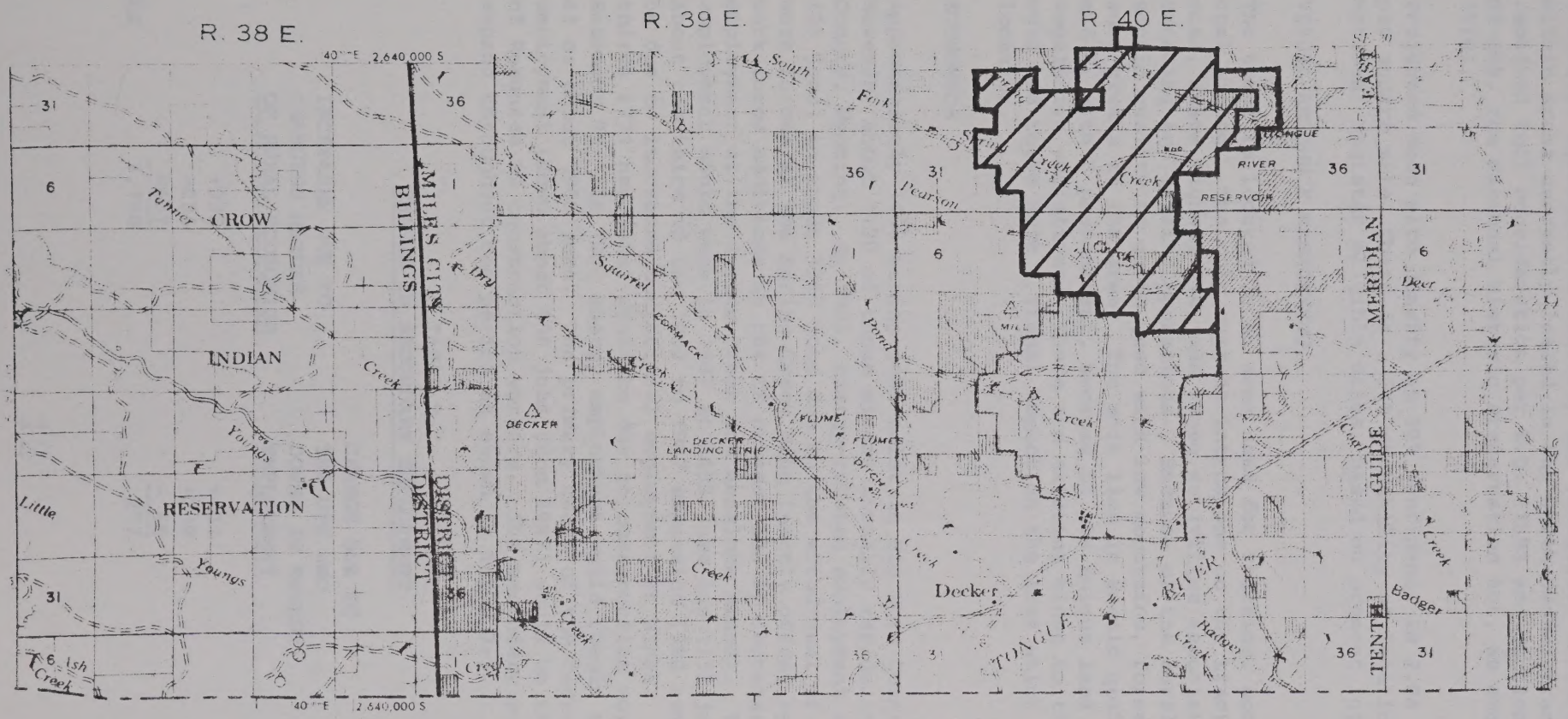
I. CULTURAL RESOURCES

Within the North Decker tract, 2,600 acres, including 86% of the surface over federal coal, have been inventoried at varying levels of intensity in nine surveys: sponsored by BLM (Haberman 1973, Loendorf et al. 1973), USGS (Lahren 1977) and private industry (D. Fredlund 1973, L. Fredlund 1977, 1978, Fox 1977, Gregg 1979, Carmichael et al. 1979). (See Map 2.) The surveys to date have identified 30 prehistoric sites, including 21 lithic scatters, one lithic scatter with associated hearth remains, three lithic scatters with associated faunal remains, two stone circle sites, and three lithic raw material sources with associated lithic scatters, one historic stone-lined dugout, and 34 isolated finds. Seven sites have been determined eligible for the National Register of Historic Places; six of these are in section 29, T.8S., R.40E., the west half of which is part of the Spring Creek Archaeological District (BLM 1979). Two additional sites have been recommended eligible for inclusion in the Natioal Register of Historic Places, in consultation with the Montana State Historic Preservation Office. BLM is seeking determinations of eligibility for the two sites from the Keeper of the National Register. The eligibility of nine sites for inclusion in the National Register is undetermined at this time.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

MAP 2
CULTURAL SURVEY CONDUCTED ON TRACT



ACREAGE INVENTORIED FOR CULTURAL RESOURCES 1971-1979

NORTH DECKER EMU

Present impacts to cultural resources derive principally from rodent activity, agricultural activity and vandalism. Cultural resources within areas currently leased in the North Decker tract have received full consideration per E.O. 11593 and Section 106 of P.L. 89-665, the National Historic Preservation Act, as amended (SHPO 1978).

Projected mean site density at 99% confidence is 7.04 $\pm$ 2.02 sites per square mile. There is a 28% probability of locating additional National Register eligible sites, based on present information.

J. VISUAL RESOURCE MANAGEMENT

The tract is located in an area used for ranching, some farming, and coal mining. The only current intrusions on the tract are a county road, State Highway 314, and those activities associated with the ranching and farming operations. Because of the rural nature, scenic quality is quite good with low mountains, forested hills and some breaks in the area. The unit lies in scenic quality Classes B and C, with B predominant, because of its unique land forms and vegetative variations. There are existing mines to the south and west and these have a visual impact on the area which varies with location.

K. ECONOMICS

Approximately 1450 mining jobs exist in Big Horn County in 1980. However, about 1100 of those miners actually reside in Sheridan County, Wyoming. By 1983, energy-related employment would drop (by 150 jobs) to about 1300 jobs due to the withdrawal of construction work forces at the Spring Creek Mine (partly offset by construction work force additions at the CX project and by increased operations employment at the Spring Creek and Absaloka Mines). Energy-related employment would peak in 1987 at 2453 jobs (up 1153 jobs from 1983). About one-third of the 1983 to 1987 expansion (382 new jobs) would be due to increased operational employment at mines. The other two-thirds (771 new jobs) would be due to construction work forces at Resource 89. In 1990 energy employment would (begin to) stabilize at or about 1900 jobs. The primary cause of the decrease in energy employment (down about 550 jobs from 1987) would be the withdrawal of Resource 89 construction workers. The secondary work force would expand throughout the period as shown in Table 9-2.

TABLE 9-2
CHANGE IN SECONDARY EMPLOYMENT

YEAR	INCREASES DUE TO CHANGING NATURE OF RURAL ECONOMICS	CHANGE DUE TO THE UPS AND DOWNS IN ENERGY EMPLOYMENT	TOTAL CHANGE EXPECTED
1980-1983	+295	+ 34	+329
1984-1987	+454	+299	+753
1988-1990	+437	- 56	+381
TOTALS	1,186	277	1,463

Of the Primary (mining) and secondary jobs shown forming between 1980 and 1990, 499 primary jobs and 123 secondary jobs were assigned to the new town of Spring Creek.

L. SOCIOLOGY

1. Population

Because it is assumed that all new population from a North Decker mine would settle in the new town of Spring Creek, which is not now in existence, there is no existing environment.

2. Community Services

See foregoing discussion of population.

3. Attitudes

Overall, most residents in the Powder River area of Montana favor coal development (BLM 1980). This favorability, however, is not unconditioned; if it is felt that the nation does not need the coal to ease the national energy problems or that reclamation is not possible or not planned, favorability towards coal development would be greatly reduced.

Also associated with attitudes towards coal development are desires to see some controls on development. The controls are of two types: environmental and governmental. Environmental controls are centered around reclamation and concern for water supply and quality. The governmental controls are unspecified, but a strong feeling exists that some level or levels of government should exercise some controlling authority over development. Stated in another way, it is felt that mining companies should not have a free hand in the development of coal.

With respect to whether people were more concerned with environmental or social impacts, the responses were evenly split.

Similarly, a random sample of residents of Sheridan County, Wyoming, shows a marked favorability towards leasing federal coal. Of the 34 persons interviewed, 22 favored coal development, 6 were opposed, and 5 were in favor only under certain conditions, e.g. if the coal is needed. One response was not usable.

One of these concerns with additional development is that Wyoming gets most of the impacts while Montana gets all of the taxes, e.g. severance tax. Another concern is water availability with more leasing.

A breakdown of attitudes towards coal development by agricultural-nonagricultural respondents is not available at this time. However, it will be included in the EIS.

M. NOISE

Noises are of a natural origin except for influence from vehicles, farm machinery, and mining activities. The influence from the latter varies with location.

CHAPTER III ENVIRONMENTAL CONSEQUENCES

This section describes the significant environmental effects that would occur with implementaton of the proposed action, including alternatives. Such items as threatened and endangered plant and animal species, floodplains and wetlands, and wilderness values have been considered and are discussed as appropriate. Also, negative declarations included in the matrices are not presented within the impacts discussion in this section. Principal basis for the analysis is the professional judgments of the resource specialists, public and other agency input, and related works, as referenced.

I. NO ACTION ALTERNATIVE

The no action alternative would result in a possible "by-pass" situation of federal coal resources underlying unleased areas, since a mine company (West Decker Coal Co.) has indicated mining would commence on leased acres in the EMU with a permit expected in 1982.

Under the no action alternative, about 59 million tons of unleased coal would not be recovered. At 1.55 million tons of annual production and $10 per ton, the federal royalty foregone of (at least) 12.5% of gross value would be (1977 dollars) $1,940,000 per yield. The state severance tax per year (1977 dollars) would have been $3,410,000 per year and the gross proceeds tax (taxes) to the county and schools, would have been $393,000 (at 76.81 mills and $3.30 of taxable value per ton)

Under the no action alternative, the paleontological resource would remain undisturbed. However, the potential for exposure and study of unearthed fossils would be lost.

If mining does not occur on the unleased area, the impacts related to this tract would be experienced only in areas to be mined.

II. PROPOSED ACTION

A. TOPOGRAPHY

The natural variety of landforms now displayed within the area would be slightly reduced by mining. Slopes along drainages would be reduced to abate erosion. Changing or altering the natural erosional patterns will increase the rates of the area's sediment yield until such time that natural vegetation can be reestablished.

B. GEOLOGY

The major impact of the proposed action would be the removal of about 59 million tons of currently unleased federal coal. The Dietz 3/Canyon coal seam may be committed to non-use if it is not mined at the time the Anderson/Dietz 1 and Dietz 2 are removed.

C. PALEONTOLOGY

Fossils may be destroyed during the mining process. However, surface disturbance may unearth fossils that could be collected and studies made of specimens that would have otherwise remained buried.

D. SOILS AND RECLAIMABILITY

The proposed action would have a significant impact on the soil in the tract (See Table 9-1). By the end of mine life, 5,361 surface acres would be disturbed.

Soil impacts include: displacement of soil from wind and water erosion, change in soil structure and natural fertility, soil compaction from haul roads, and significant problems in revegetation and stabilization on steep slopes.

In the tract, there is a low potential displacement of soil by wind erosion of 100 percent and a moderate potential displacement of soil by water erosion of 59 percent. (See Table 9-1.) Proper seeding of the stockpiles will reduce this.

Disturbances of the soil would result in alterations of soil structure and porosity. This alteration would affect permeability, infiltration rates, soil-air and soil-water relationships and bulk density. The natural fertility would be affected by disruption of the nutrient cycle and a decrease in organic matter content within the soil. Salinity content would increase as a result of the lower calcareous horizons being brought to the surface.

The soil reconstruction potential is derived from the National Soils Handbook (USDA). The soil hazard conditions determine the reconstruction potential. The tract is rated as 90 percent fair and 10 percent poor for reconstruction. Suitability of the soil material for plant growth is rated as one percent good, 43 percent fair, nine percent poor and 47 percent unsuitable. (See Table 9-1.) The soils rated poor can be reclaimed, but would require more intensive and costly management to be revegetated and stabilized.

E. WATER RESOURCES

1. Ground Water

Flow into the pit during mining would be highest among the tracts, over 200,000 cu ft/day. About two wells outside the tract would be affected by mining the currently non-leased acreage. Three wells would need to be redrilled to about the same depth, if needed after mining. Chemical quality would undergo little change after mining, because of ready dilution of any spoil-introduced salinity through rapid flushing by non-spoil water.

2. Surface Water

Stream flow in Spring Creek would only be slightly reduced during mining if adequate buffers and diversions are used. Stream flow and water quality changes would be small following mining. Sediment yields can be considered to be proportional to soil erosion losses discussed in the soils section. The channel could produce sediment while stabilizing.

3. Alluvial Valley Floors and Floodplains

Mining of Spring Creek and alluvium could disrupt the flow during mining by diverting and detaining it. After mining, channel stabilization may be a problem. However, state and federal regulations require restoration of stream channels.

F. VEGETATION

If the range is in excellent condition (100-76%) there would be a loss of 1,636 to 1,051 AUMs. However, in its present condition, there would be a loss of approximately 1,031 AUMs.

Reestablishment of native vegetative communities depend upon climatic conditions, species diversity and reclamation technique. In 1981, there would be 134 acres disturbed by mining and every year thereafter another 134 acres would be disturbed for each year of the mine life. By the year 2027, total vegetation should have been reestablished.

The reclamation process for the initial cut would probably be delayed for 2-3 years dependent upon the mining operation. When the mining operation gets into a cut-and-fill situation then the reclamation process would start. Provided there is adequate vegetation present on the reclaimed land, grazing would start after the sixth or seventh year on the initial 134-acre cut and approximately in the fifth year after the mining process becomes a cut-and-fill operation. As mining proceeds in different areas of the tract, not all of the land is utilized for mining at any one time and grazing could occur on portions of the tract.

Mining of the area would temporarily eliminate opportunities for domestic livestock to occupy the surface and to utilize the forage. However, vegetative production may be better after mining (due to extensive reclamation work) and the area may produce more than the current number of AUMs per acre. There is, however, no evidence that the plant community that ultimately evolved would support higher levels of livestock grazing than the premining vegetation supported.

Additional impacts resulting from vegetation disturbances would be (a) possible reduction of the visual aesthetics, (b) increased soil erosion, and (c) reduction in the amount of wildlife and livestock forage.

The Office of Surface Mining assures that the mining company establishes a diverse, effective and permanent vegetative cover to standards set by the Montana Department of State Lands and the federal Bureau of Land Management.

G. LAND RESOURCES

1. Agriculture

The proposed action would have a significant impact on agriculture in the tract (see Table 9-3). By the end of mine life, 3,760 acres would be disturbed, in addition to 220 surface acres used for facilities and haul roads.

Impacts on agriculture include displacement of 623 acres of dryland (90 acres of wheat and 533 acres of alfalfa) of class II and III privately-owned land that would produce, on the average, 498 tons of alfalfa and 125 AUMs and 1,800 bushels of wheat or 12,460 bushels of wheat per year. This land is suitable for irrigation, but has not been irrigated for about the past five years. If this land were irrigated, it could produce 2,989 tons of alfalfa and 312 AUMs or 31,653 bushels of wheat per year.

a. Impact on Agricultural Sales Activity

Assuming, for analytical purposes, a ranch output figure of $164 (1977) dollars) per cow/calf unit and 10.75 AUMs or 0.7 tons of hay as the forage requirements of, respectively, a fully allocated cow/calf pair[1/] or fully allocated cow/heifer with calf in utero[1/], we have (assuming a five-year disturbance cycle):

1/ A fully-allocated cow/calf pair (ccp) or cow/heifer with calf in utero (ccu) includes the amount of forage needed to sustain the ccp/ccu plus the pro rate share of the forage needs of replacement heifers, herd bulls and horses (if any) and is, therefore, the sum of both direct and indirect forage needs.

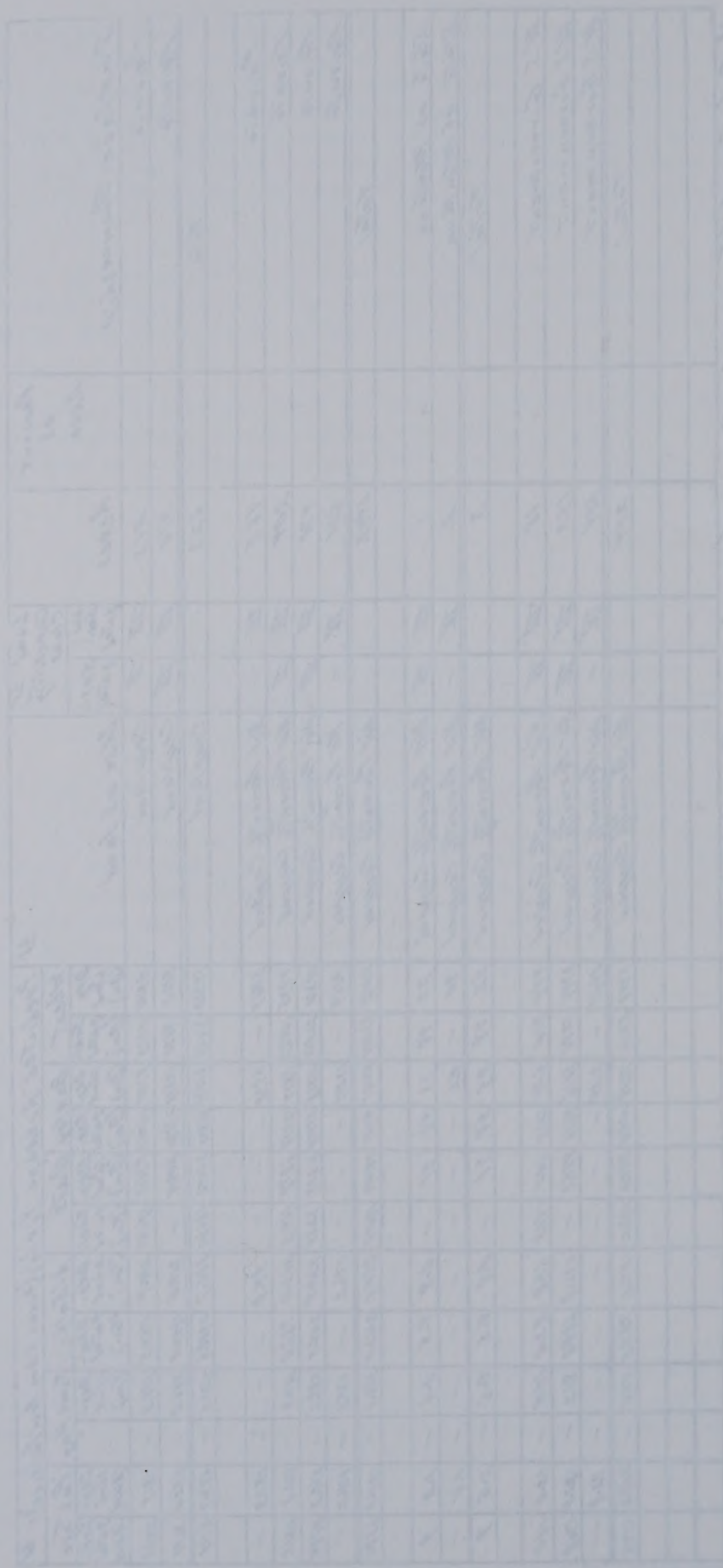
TABLE 9-3

NORTH DECKER

Surface Ownership	Percent of Area	Acres	Land Capability Class 1/ Non-Irrigated	Land Capability Class 1/ Irrigated	2/ Use of land	Predicted Average Yields (Acres x Ave. Acre Yield/Acre) = 2/ Wheat Dry land (Bu)	Wheat Irrigated (Bu)	Barley Dry land (Bu)	Barley Irrigated (Bu)	Oats Dry land (Bu)	Oats Irrigated (Bu)	Alfalfa Dry land (Ton)	Alfalfa Irrigated (Ton)	Tame Hay Dry land (Ton)	Tame Hay	Pas. Type Dry land (AUM)	Pas. Type Irrigated (AUM)
Private		213	III	II	Cropland	5302	11973	8304	15042	9360	18650	207.7	1143.5	174.5	–	19.7	2420
Private		410	III	III	Cropland	9020	19680	13530	23780	20910	–	369.0	1845.0	246.0	–	492.0	3690
Total		623			Cropland	14322	31653	21834	38822	30270	18650	576.7	2988.5	420.5	–	683.7	6110
Private		167	III	–	Not Presently Cropped	3767	–	5938	–	–	–	54.9	–	–	–	150.3	–
Private		204	III	II	Not Presently Cropped	4935	10482	7544	13957	6879	16413	203.0	987.0	164.9	–	170.0	2302
Private		470	III	III	Not Presently Cropped	10370	22522	13558	27518	21828	3264	424.4	2115.0	289.2	–	550.2	4284
Private		601	IV	–	Not Presently Cropped	9069	–	13047	–	–	–	171.2	–	134.0	–	441.2	–
Total		1442			Not Presently Cropped	28081	33004	42087	41505	28707	19677	854.5	3102.0	588.1	–	1311.7	6586
State of Montana		1	III	III	Not Presently Cropped	22	48	33	58	51	–	0.9	4.5	0.6	–	1.8	9
State of Montana		2	IV	–	Not Presently Cropped	30	–	42	–	–	–	–	–	–	–	1.4	–
Total		3			Not Presently Cropped	52	48	75	58	51	–	0.9	4.5	0.6	–	2.6	9
U.S. Government		18	III	II	Not Presently Cropped	444	914	628	1254	100	1412	17.8	83.0	14.4	–	13.0	180
U.S. Government		152	III	III	Not Presently Cropped	3344	7296	5016	8816	7752	–	136.8	684.0	91.2	–	182.4	1368
U.S. Government		104	IV	–	Not Presently Cropped	1560	–	2184	–	–	–	–	–	–	–	72.8	–
Total		274			Not Presently Cropped	5348	8210	7828	10070	7852	1412	154.6	767.0	105.6	–	268.2	1548

1/ Soil Capability classification is derived from the published Big Horn County Soil Survey Report issued December, 1977.

2/ Cropland, Land Suitable for cropland and Average predicted crop yields derived from the published Big Horn Soil Survey Report, issued December, 1977 and data from Agricultural Stabilization and conservation Service, Big Horn County.



LLS (lost livestock sales) =

$$\$164 \left(\frac{.125 \text{ minewide AUMs}^{2/}}{10.75}\right) + \left(\frac{.125 \text{ minewide hay}^{2/}}{0.7}\right)$$

Based on the formula above, the loss of ranch output (LLS) due to mining of North Decker would be about $16,800 per year (at peak disturbance). The loss of secondary income dependent on ranch output (wages and profits in business and government(s) which supply or depend on agriculture) would be $4,200 per year.

Assuming, for analytical purposes, a crop output figure of $2.85 per bushel[3/] of wheat, the loss of crop output (LCS) due to mining of North Decker would be about $640 per year. Total on-site agricultural impacts (LLS + LCS) of about $17,400 per year make this EMU sixth in the order of agricultural impacts.

b. Off-site Impacts

As the North Decker mine can open without new federal leases, the off-site impacts from urbanization at the Spring Creek New Town due to federal leasing would be negligible (less than $50 lost ranch output per year). Only about 15 of the households in Spring Creek (or about 12 acres of land converted to dwellings) would be attributed to the increased production level made possible by federal lease.

c. Perspectives on Economic and Social Impacts

Since there are no non-industrial private surface owners within the North Decker EMU, a survey of agricultural landowner perceptions was not made.

2. Recreation

No significant long-term impacts are expected to occur on the tract. Some secondary impcts would occur. Overall recreational demand on federal and private lands would increase due to population increases and the construction or relocation of roads at the mine site might improve legal and/or physical access to some areas. These increases would probably reduce levels of recreation enjoyment due to increased crowding, litter and pollution at and near developed recreation sites.

2/ Using a 5-year disturbance period over the 40-year mine life, .125 of the forage would be lost at peak disturbance.

3/ Using a 7-year moving average wheat price to normalize year-to-year price fluctuations.

3. Other Land Uses

Impacts on land use would be relatively minor but highly concentrated. Industrial activities would be introduced into an area of no previous activity but which has the ability to support mining without construction of major facilities or improvement of existing transportation routes as the West Decker mine facilities would be used. The existing ranching, farming, and wildlife uses of the tract would be displaced for the life of the mine but would again be possible after reclamation. The mine will distrub 5,440 acres plus additional off-site acreages for relocation of roads. Assuming a right-of-way width of 100 feet, the additional disturbed area would total 78 acres for moving 6.5 miles of the state highway and county road.

Changes in the land from these mine-related uses would be mostly temporary and insignificant after reclamation.

Since West Decker facilities will be used, the existing road and rail systems are adequate and will not require expansion for increased traffic. Increased road and rail traffic will increase the potential for more accidents because of greater exposure. All impacts would cease at the end of mining if unnecessary transportation corridors are abandoned and reclaimed; however, this type of land use commonly remains longer than the activity it serves.

H. WILDLIFE

The impacts upon wildlife habitat and populations are summarized in the matrix (appendix). Impacts are rated for the projected 40-year life of the mine.

Approximately 400 acres of crucial antelope winter habitat would be lost to mining. Impacts on these winter ranges would not be limited to those areas within the EMU, as the increased number of people present would affect all of the area. Some traditional areas have already been disrupted and the construction of the proposed Spring Creek townsite will further destroy habitat values. Up to 375 animals will be affected by this impact.

Spring, summer and fall use areas for up to 30 mule deer would be lost. This may not be a substantial loss, as mule deer have adapted to the existing West Decker mine where a small resident population exists.

Mining would possibly alter the hunting territory of the golden eagle pair north of the EMU. The extent of this impact is not known as the territory is not known at this time.

Canada goose feeding sites in the alfalfa bottoms would be lost to mining. If water quality is not maintained, mining would also have a vegetative impact on fish and wildlife using the Tongue River Reservoir.

Expansion of the mine area would increase the sphere of human-wildlife interaction and vegetatively affect the wildlife populations. Mortality of deer through vehicle accidents and poaching has already been proven to be a definite problem. No estimate of this impact can be made at this time.

I. CULTURAL RESOURCES

All cultural resources within the tract boundaries are subject to direct impact over the life of a mine from construction of haul roads and mining activity, resulting in damage and destruction to sites, artifacts, their immediate environmental context, and the data these contain. Cultural resources buried by colluvial and alluvial deposition and not recognized in surface inventory, would also be destroyed.

Should the tract be leased, a program of mitigation would be developed for all affected cultural resources. Implementation of avoidance and preservation alternatives is preferred. If these are not feasible, a scientific program of data retrieval will be developed and implemented.

J. VISUAL RESOURCE MANAGEMENT

Mining would completely change the character of the tract. Visual impacts would increase in the form of land disturbances due to the mines, roads, railroads and utilities. Changes to the topography, vegetation and scenic quality would occur. Currently, there are no industrial influences in the tract. The contrast would tend to be moderate when impacts from the mines south and west are also considered. Along with this, some decrease in visibility would occur from dust and vehicle emissions. Overall, adverse impacts would be moderate during mining because the mine would be readily visible from the state highway. Generally, the visual impacts would be about the same as those of other mines in the region. All of the impacts would either cease or be reduced to very low levels when mining ends and reclamation is completed.

K. ECONOMICS

1. Employment Change

The peak construction employment for North Decker would be 50 workers in 1981. Operation employment would peak at about 84 workers in 1986. Because of this increase in energy employment, approximately 44 secondary jobs would form between 1981 and 1990. The total employment effect of the North Decker Mine would be to increase area employment by 128 jobs above the level of employment without the mine.

As mining will occur on part of the tract even without new federal leasing only part of the impacts from the North Decker mine would be attributed to the leasing decision.

2. Cost of Living

The population from North Decker is expected to locate in the new town of Spring Creek. Cost of living in Spring Creek will be high relative to other communities of the same size as all housing will be new and many costs of public services will be included in the sales price of the homes. Unlike Ashland, however, those confronting the higher costs will be newcomers with high average incomes, so the costs confronting them should not present significant problems.

L. SOCIOLOGY

1. Population

The population increase due to a North Decker mine is shown in Table 9-4. It is assumed that all employment will be new to the area and will settle in Spring Creek. The population to employment multiplier employed are 1.2 for construction workers and 1.65 for operational and secondary workers.

TABLE 9-4
NEW POPULATION FROM A DECKER NORTH MINE, 1980-1990

YEAR	NEW POPULATION	TOTAL POPULATION
1980	0	0
1981	60	60
1982	56	116
1983	0	116
1984	0	116
1985	0	116
1986	0	116
1987	3	119
1988	7	126
1989	5	131
1990	0	131

2. Community Services

New community services will have to be provided by the builders of the Spring Creek community.

3. Attitudes

The impacts of development on social attitudes cannot be assessed until after development has occurred. There is no way to estimate what changes, if any, in attitudes would occur.

4. Community Structure

A new community structure will emerge as the new population moves into Spring Creek.

M. NOISE

The present noises would significantly change from natural to industrial origins as heavy mining equipment, rail and road traffic, and explosives use are begun and combine with similar effects from adjacent mines.

III. SHORT-TERM VERSUS LONG-TERM IMPACTS

A. SHORT TERM

Production through life of mine is estimated at 126 million tons of coal. The tract would be temporarily committed to a single use that would in turn impact other potential uses.

Short-term impacts of mining this tract on wildlife would be as summarized. Up to 375 antelope would be displaced from a traditional winter range. Year-long habitat for up to 30 mule deer would be lost during the life of the mine. One pair of nesting golden eagles and their hunting territory would be disturbed. Canada goose feeding sites along the reservoir would be lost and habitat for non-game birds, mammals and reptiles would also be lost in the short term. Water quality in the Tongue River Reservoir would be affected if safeguards are not applied.

B. LONG TERM

Evidence of mining and reclamation would remain in the form of less contrasting topography and an alteration of soil texture and porosity.

Long-term imapcts on wildlife would be dependent on the success of reclamation and the future of the Spring Creek townsite. If shrubs can be restored, the vegetative diversity of the area will be maintained and post-mining species diversity would be restored. The greatest long-term impact to wildlife will be the creation of a town where none previously existed as this habitat will be lost forever.

IV. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCE

The coal removed by mining and that left by current recoverable techniques would be lost from future use.

V. NET ENERGY ANALYSIS

A net energy analysis was calculated using the guidance contained in BLM Washington Office Information Memo 79-282, August 1979. Approximately 38 British thermal units (BTUs) would be expended to produce a pound of coal. That pound of coal, in turn, would produce about 8,462 BTUs. The ratio of energy produced to that expended is over 225 BTUs/1 BTU.

The net energy relationship (ratio of energy produced to energy consumed) for the North Decker EMU is 380 to 1.[1]

1 Based on the Btu value per pound of coal as given in the tract delineation reports and on an average input energy value of 25.6 Btu's of energy consumed for each pound of coal produced (average of the energy consumption of the Decker mines as described by USGS in a 1977 EIS and the WECO area B expansion as described by the Montana Department of State Lands in a 1978 EIS). Only direct energy consumption was considered (the ratios shown do not contain any estimate of energy used in transporting the coal from the mine to the demand center).

Literature: Department of Interior, USGS. Final Environmental Impact Statement, East Decker and North Extension Mines, Decker Coal Company, Big Horn County, Volume 1. Washington, D.C.

State of Montana, Department of State Lands. Draft Environmental Impact Statement, Western Energy Area B. Helena, Montana. 1978.

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Soils	There are 27 soil series in the tract mapped at level two in a survey done by the Soil Conservation Service, which are found along gullies and on a relatively flat to gently rolling topography.	There will be displacement of soil by water and wind erosional forces; change in soil structure and natural fertility anmd significant problems in revegetation and stabilization on steep slopes.	Significance of the impact will be moderate. Reconstruction potential is rated as 90% fair and suitability of soil material for reclamability is rated as 43% fair and 47% unsuitable.	Data reliability is 80% from the Big Horn County Area Soil Survey. Better soils in the bottomlands are more accurately mapped than those on the rangelands and steep-sided slopes.	
Water Resources Ground Water Use in Tract	2 stock wells and 1 domestic well are in use in the non-leased part of the tract.	All wells will need to be redrilled if needed following mining. 1 domestic well would need to be drilled deeper to obtain comparable water.	Minimal cost for mining company to redrill well	Good	
Quantity	The natural ground water flow is estimated at over 200,000 cu ft/day and is toward the south and east.	Water will flow into the mine pit at about the given rate. Additional flow will occur from the reservoir. 2 wells will be affected outside the tract during mining.	Major flow of water into mine pit will be very significant.	Good	
Quality	Medium TDS for wells in tract is 1,200 mg/L and ranged from 800 to 3,980 mg/L.	Chemical quality would undergo little change.	Small	Good	More research is needed to predict quantitative changes in post-mining quality.
Surface Water Quantity	Spring Creek flows in response to intense rain and snow melt only. Annual flow is estimated at 213 ac. ft. Essentially no irrigation from it.	Only very slight reduction of flow during mining. Possible slight effect after mining.	Small	Fair-Good	

ELEMENT	PRESENT SITUATION		ANTICIPATED EFFECT OF LEASING/DEVELOPMENT		SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Quality	Mean TDS is about 675 mg/L Water is generally suitable for irrigation use.		Little or no change in salinity. Sediment yields should be proportioned to soil erosion loss except the channel may produce sediment while stabilizing after mining.		Very small	Good	
Alluvial Valley Floors and Flood Plains	Spring Creek is a possible AVF.		Change in stability of channel and floodplain if mined.		Possibly significant if channel is mined.	Good	Spring Creek AVF status has been in flux.
Wildlife Habitat	Acres	% of Total	Acres Disturbed	Year 2026			
Grassland	1694	32	1694	Low negative	Low negative	Good	
Sagebrush-grassland	3044	57	3044	Moderate negative	Low negative	Good	
Reservoir	50	1	0				
Agricultural	573	10	573	Low negative	Low negative	Good	
Population	Level of Use						
Mule Deer	Average		Low negative		Low negative	Good	
Antelope	High		Moderate negative		Moderate negative	Good	
Canada Goose	Low		Low negative		Low negative	Good	
Golden Eagle	Average		Low negative		Low negative	Good	
Non-game birds and mammals	Low		Low negative		Low negative	Good	
State species of special interest or concern	Low		Low negative		Low negative	Good	
Threatened or Endangered	None Occur		-----		-----		

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Cultural/Historical Values	86% of tract acreage, 86% of surface over federal coal inventoried at varying levels of intensity. 30 prehistoric sites, 1 historic site, 34 isolated finds recorded. 7 sites determined eligible for National Register; 2 sites recommended eligible, 9 sites of undetermined eligibility. 41% of known sites on ridges and benches, 13% on spurs, 13% on hilltops, 23% on terraces, 6% on slopes, 3% on draws.	Direct impact to cultural resources within tract boundaries.	Damage and destruction to sites, artifacts, immediate environmental context and the data these contain. Mitigation, while providing a short-term benefit of information gained on the region's prehistory and history, constitutes an irretrievable, irreversible commitment of the resource.	Excellent due to intensive survey and resurvey (Gregg 1979), Carmichael 1979, Fox 1977, Fredlund 1977, Lahren 1977, Haberman 1973, Loendorfetal 1972).	
Recreation	No development or known use of the area. Very limited use may occur. Hunting by permission of landowner. No public access exists.	None. No recreation functions are planned for the area and legal access does not exist.	Virtually none on the short term. No effect on a long-term basis.	Poor	Recreation data is virtually non-existent.
Wilderness	No wilderness potential within or near area.	None	None	Excellent	Wilderness inventory complete and area eliminated from consideration

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
VRM	Area used for ranching and some coal mining. Scenic quality good with low mountains, hills, and some breaks. Scenic quality classes B and C, with B predominant. Existing mines west and south have effect on area. Area visible from State Highway 314.	Disturbance of landforms and natural scene. Impacts cumulative with area mines. Some activities visible from State Highway 314.	Moderate during mine life. Low after reclamation.	High	Very difficult to mitigate impacts while mining is occurring.
Noise and Air Quality	Noises and odors mostly of natural origin. Some influence from nearby strip mine.	Significant change from natural to industrial origins with use of heavy equipment and explosives. Effects cumulative with adjacent mines.	Quite severe during mining. Impacts would cease when mine is closed.	Excellent	Impossible to mitigate during mine life.
Transportation					
Employee	Roads are improved for access to existing mines. Site access by gravel road	Slightly increased traffic on State Highway 314. Potential for more accidents.	Moderate on all accounts during mining. Very low after mines close.	Good	Road improvements should contribute to safety after mining traffic ceases.
Product	Rail service exists to the West Decker mine and will be used for the North Decker mine.	Increased traffic hazards.	Moderate	Good for all items.	
Land Use	Ranching is primary use. Some farming of river bottomlands.	Introduction of industrial activity. Existing uses displaced. Surface disturbance created.	Moderate during mining. Low to none after reclamation.	Good	

References

U.S. Department of Agriculture, Soil Conservation Service. "Soil Series Descriptions and Interpretations."

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey Staff. "National Soils Handbook."

U.S. Department of the Interior, Geological Survey and Montana Department of State Lands. "Draft Environmental Statement Regional Analysis, Northern Powder River Basin Coal, Montana." 1979.

U.S. Department of the Interior, Bureau of Land Management. "Recemmondation/ Rationale Statement for Decker North Extension Coal Lease Application." 1979.

References

Van Voast, W.A. and Hedges, R.B. Hydrogeologic Aspects of Existing and Proposed Strip Coal Mines near Decker, Southeastern Montana. Montana Bureau of Mines and Geology Bulletin 97, Butte, 1975.

References

Carmichael, G. Alan, Ekland, Arlene, Kinnly, W.J. 1978 Archaeological Investigations in the Spring Creek Mine Area. Missoula, Montana: University of Montana. 1979.

Fredlund, Dale E. 1971 Archaeological Survey, Decker Coal Company Lands, Big Horn County, Montana. Missoula, Montana: University of Montana. 1972.

Fredlund, Lynn B. Archaeology of East Decker and the North Extension. Butte, Montana: Cultural Resources Division, Mineral Research Center, Reports of Investigations No. 4. 1977

Three Cultural Resource Projects near Decker, Montana, for Decker Coal Company. Butte, Montana: Cultural Resources Division, Mineral Research Center. 1978.

Fox, Richard A. Archaeology of the Spring Creek Mine Area Survey and Testing Phases. Missoula, Montana: University of Montana. 1977.

Gregg, Michael L. Inventory and Assessment of Archeological Remains on Decker-Pearson Creek. Butte, Montana: Cultural Resources Division, Mineral Research Center. 1979.

Haberman, Thomas W. 1972 Archaeological Survey in the Decker-Birney Area of Big Horn County, Southeastern Montana. Western Interstate commission for Higher Education (for the Bureau of Land Management). 1973.

Loendorf, Lawrence L., Barnett, M.V. and Larson, T.K. The Decker Birney Archaeological Survey, Big Horn County, Montana. Grand Forks, North Dakota: University of North Dakota (under cooperative agreement with the Bureau of Land Management). 1972.

Lahren, Larry A. The Impact of Coal Development on Cultural Resources in Southeastern Montana. Livingston, Montana: Anthro Research, Inc. (for the United States Geological Survey). 1977.

U.S. Department of the Interior, Bureau of Land Management, Miles City District Office. Determination of Eligibility for the Spring Creek Archaeological District (Letter to the Montana State Historic Preservation Officer, Helena, Montana). March 16, 1979.

References

Hickey, W. C. Sr. A Discussion of Grazing Management Systems and Some Pertinent Literature. U.S. Department of Agriculture, Forest Service 1969.

Hunter, H. E., R. L. Ross. Climax Vegetation of Montana. U.S. Department of Agriculture, Soil Conservation Service. 1976.

Payne, G. F. 1973. Vegetative Rangeland Types in Montana: Bozeman, Montana Agricultural Experiment Station, Bulletin 671. 16 p.

U.S. Department of Agriculture, Soil Conservation Service. Technicians Guide Section II-E-3 Range Site Criteria. 1972.

U.S. Department of Agriculture, Soil Conservation Service. Rosebud and parts of Big Horn County, Advanced Material Subject to Review and Approval. March 1977.

U.S. Department of Agriculture, Soil Conservation Service. National Range Handbook. 1976.

U.S. Department of Agriculture, Soil Conservation Service. Technicians Guide IIE. Range Site Criteria. 1972.

U.S. Department of Agriculture, Soil Conservation Service. Climax Vegetation of Montana. 1976.

U.S. Department of Agriculture, Soil Conservation Service. Technicians Guide Section II-E-3 Range Site Criteria. 1973.

U.S. Department of Agriculture, Soil Conservation Service, U.S. Department of Interior, Bureau of Indian Affairs, and Montana Agricultural Experiment Station. Soil Survey of Big Horn County Area, Montana. Issued 1977.

U.S. Department of Agriculture, Forest Service and Soil Conservation Service, U.S. Department of Interior, Bureau of Land Management and Montana Agricultural Experiment Station. Soil Survey of Powder River Area, Montana. Issued 1971.

U.S. Department of Interior, Geological Survey and Montana Department of State Lands. Northern Powder River Basin Coal. Montana. 1979.

U.S. Department of Interior. Bureau of Land Management. Soil Vegetation Inventory Methods. 1979.

U.S. Department of Interior, Bureau of Land Management Forage Requirements Range Workshop. Albuquerque, New Mexico. 3/13/80.

Wildlife Management Institute. If Deer Are to Survive. Stackpole Books, Harrisburg, PA 1971.

Consultation

Coenenberg, J. Vegetation Specialist, Western Energy Company, Colstrip, Montana. 1980.

Hemmer, D., Montana Dept. of State Lands. 1980.

References

USDI/BLM. Powder River Resource Area, Management Framework Plan Amendments. Miles City BLM District Office, Montana. June, 1980.

USDI/BLM. Land Use Analysis and Tehnical Examination/Environmental Assessment, West Decker Coal Lease Application. Miles City, Montana, February, 1980.

USDI/BLM. Technical Examinations and Environmental Assessment, Decker North Extension Coal Lease Application. Miles City, Montana. July, 1979.

USDI/BLM. Powder River Resource Area, Management Framework Plan Update Report. Miles City BLM District Office, Montana, July, 1979.

USDI/FWS. Winter Distribution (1975-1978) of Pronghorn Antelope, Mule Deer and White-tailed Deer in the Decker Sub-Region of Montana and Wyoming. Denver Wildlife Research center, Sheridan Field Office, 1978.

VTN Consulting Company. Spring Creek Mine Applications, Wildlife Baseline Study. Report prepared for Northern Energy Resources Company, 1977.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225